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(54) Locking means for a self-service device as well as self-locking latch and actuator means.

(57) For making the locking means 1 for the opening of a self-service device, in particular an automatic teller machine, water-repellent, a locking flap 7 is provided, the outside of which is indented 16. Locking flap 7, pivotable about axis 9, is positioned in the upper region behind a projecting wall panel 3 and in the lower region in front of a recessed wall panel 4. As gap 18 is opened, its width increases, so that any ice formed may be broken up or jammed objects are released automatically. The self-locking latch and actuator means 31, favourably designed according to the invention, uses an actuating lever 38 which is pivotable about axis 9. The actuating lever comprises a particularly shaped guide slot 37 which is engaged by the actuator means (32, 34, 35). In the first part 39 of the guide slot 37, no displacement work is performed by the actuator means, whereas in the second part 40, which is positioned at an angle to the first part 39, displacement work is performed in favourable directional association.

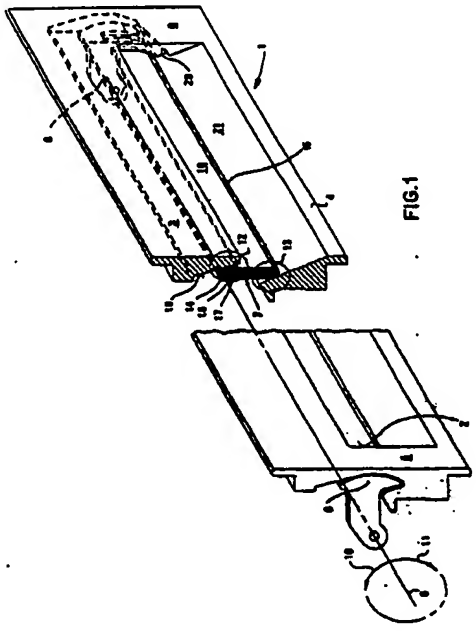


FIG.1

EP 0 315 735 A1

Locking means for a self-service device as well as self-locking latch and actuator means

The invention concerns a locking means for an opening in the wall of a self-service device, in particular for a dispense or deposit gate of an automatic teller machine. The invention also concerns a self-locking latch and actuator means for pivoting a movable component to one of two positions, in particular for actuating a locking means of a self-service device.

The problem with self-service devices, such as cash terminals and automatic teller machines, is that they are not only installed in the lobby of, say, banks but that they may also be installed facing the road unprotected against weather. In such a case, the external function units will be exposed to extreme climatic conditions, such as rain, snow, cold and strong sunshine. One mechanical assembly that must withstand such extremes both statically and kinematically is the locking means which releases or covers the dispense gate. There are also devices which are provided with a second function unit of the same typical design as the first, namely, the locking means for the gate through which enveloped notes, cheques and the like are deposited.

The decisive requirements to be met by such a function unit are that it must be rain water repellent, that it must not freeze up and function even when the locking means becomes blocked by the formation of ice or as a result of vandalism.

Existing cash terminals use locking means which do not meet the preceding requirements satisfactorily.

One design concept comprises, for instance, a slotted cylinder which is supported on a plate provided with a slot. In the opened position, currency is fed to the outside through the slot in the outer wall and the aligned twisted slot in the cylinder. Water may enter through the top and bottom joints between the cylinder and the outer wall. If a slot of relatively small size is used, this may cause serious problems in the existing high temperature range. A disadvantages of this kind of sealing is that the mechanism freezes up rapidly in the winter. Another serious disadvantage is that the mechanism may become blocked by jammed objects.

Another existing design concept comprises a plate behind which a slide is arranged which through a gear and pinion is shifted by a motor to close or release the opening in the plate. In this case, too, the bottom joint between the slide and the outer plate is liable to cause problems, since it is here that water may enter or ice preferably forms. Even if the ice formed is smashed as the flap is opened by a suitably strong motor, it is frequently observed that fresh ice forms in the opened position of the flap, so that the latter does not close reliably. The function of this design, too, may be disrupted by objects becoming jammed between plate and slide as a result of vandalism.

It is the object of the present invention to design a locking means according to the preamble of claim 1 such that the preceding problems are eliminated, and that adverse effects produced by water, the formation of ice and jammed objects are substantially avoided and precluded.

This object is accomplished in principle by the features described in the characterizing part of claim 1.

The advantages achieved by the invention are essentially that over a wide range of the built-in position rain water is reliably repelled so that the formation of ice is substantially avoided, and that any ice forming despite of these precautions is broken up by the design features provided and that jammed objects do not prevent opening the locking means. The reliable and well-functioning locking means thus obtained meets the requirements to be observed for a unit exposed to the preceding weather conditions in an optimum manner.

Preferred further developments and embodiments of the invention are specified in the subclaims 2 to 7. The resulting advantages are either obvious or will be especially described below by way of example.

The locking means according to the invention or other similarly designed lockings means or, more generally speaking, components that are movable to either of two positions, should be latched in the closed or one end position. The self-locking latch and actuator means provided according to the preamble of claim 8 is suitable in particular for actuating the locking means of the invention.

It is the object of such a latch means to move the respective component in a simple manner and at minimum force to either of its end positions and to reliably retain the component in its latched position. The force required for this purpose should be reduced to a minimum, and the mechanical components should be as simple as possible.

This object according to the invention is accomplished in principle by the features described in the characterizing part of claim 8.

The advantages obtained by such a design are essentially that the motor, while quasi-idling, is capable of starting from a reliable latch position without performing any displacement work, encountering the component to be displaced in an optimum direction only after a certain starting period at

a moment that has since built up. The design of the mechanical components required for this purpose is simple.

Advantageous further developments of this design are specified in claims 8 to 11. The advantages obtained are either obvious or are described in detail below with reference to a specific embodiment.

One way of carrying out the invention is described in detail below with reference to drawings which illustrate only one specific embodiment, in which

Fig. 1 is a schematic isometric partly sectional view of the locking means according to the present invention;

Fig. 2 is a schematic isometric partly sectional view of the locking flap designed according to the invention;

Fig. 3 is a schematic sectional view of the locking means according to the invention in two possible built-in end positions to illustrate the reliable operating range;

Fig. 4 is a schematic partly sectional side view of a self-locking latch and actuator means according to the present invention forming one assembly with the locking means of the invention in a latched or a closed position;

Fig. 5 shows the arrangement of Fig. 4 but in an intermediate position of the drive arm in which the opening is still closed but already unlatched;

Fig. 6 shows the arrangement of Fig. 4 but in a further intermediate position in which half the opening of the locking means is opened;

Fig. 7 shows the arrangement of Fig. 4 but in the other unlatched and completely opened position, and

Fig. 8 is a schematic rear top view of the arrangement of Fig. 4.

The essential components of the locking means 1 according to the invention are described in detail below by means of Figs. 1 to 3.

Fig. 1 is a schematic isometric partly sectional view of a locking means 1 according to the present invention. This locking means 1 for an opening 2 substantially consists of a top front wall panel 3, a lower recessed wall panel 4 as well as two side elements 5 and 6 linking the two panels 3 and 4. The lower wall panel 4 is recessed farthest immediately adjacent to the top front wall panel 3. A locking flap 7, mounted on two levers 8, is pivotable about an axis 9 extending parallel to the wall panels 3 and 4. For opening the locking flap 7, it is pivoted upwards by a predetermined angular amount in the direction of arrow 10. It is closed by being pivoted downwards about axis 9 in the direction of arrow 11.

The locking flap 7 is arranged in such a manner that when opening 2 is closed, it is positioned partly behind the upper front wall panel 3 (see in particular the encircled region 12) and partly in front of the lower recessed wall panel 4 (see the encircled region 13). In the upper region 14 facing the outside and in the lower region 15 also facing the outside, the locking flap 7 is substantially cylindrically shaped. Between these two regions 14 and 15, the outer surface of the locking flap 7 is provided with a substantially planar recess or indentation 16. The transition between the cylindrical region 14 and the recess or indentation 16 is designed as a step 17 in the upper region.

To match the pivotal range of the locking flap 7, the inner face 19 of the upper protruding wall panel 3 is inclined towards the top and the inside, with a gap 18 being formed between the locking flap 7 and this inner face 19. As a result, a nose-shaped projection is formed in the region of the lower edge 20 of the upper front wall panel above the transition between the cylindrical region 14 and the substantially planar recess 16 with its step 17. When the locking flap 7 is opened by being pivoted upwards in the direction of arrow 10, the width of the gap 18 between the outer elements of the locking flap 7 and the inner face 19 of the upper front wall panel 3 increases continually. The great advantage of this is that any ice formed in gap 18 is broken up and that jammed objects are not pulled farther inside the gap but are released to be removed as the width of the gap increases.

As may be seen from Fig. 1 and the perpendicular arrangement of Fig. 3, the lower edge 20, forming a nose-shaped projection above the outer top region 14 of the locking flap 7, and the lower region 15 of the locking flap 7, protruding the recessed wall panel 4, effectively repel any ingress of water from the locking means designed according to the invention.

To reliably seal the locking flap 7 and the outer surface 21 of the lower recessed wall panel, the shape of the inner surface 22 of the lower portion of the locking flap 7 is adapted to the outer surface 21 of the wall panel 4, which extends downwards towards the outside. The adaptation is such that the bottom-most edge 23 is bound to come to rest against the outer surface 21, so that reliable sealing is also ensured in the extreme inclined position of about 25°, as shown in the left bottom position in Fig. 3.

Fig. 2 is a schematic isometric partly sectional view of the locking flap 7 with its special features without the wall panels 3 and 4 and the side elements 5 and 6. It may be seen that the substantially planar recess or indentation 16 is positioned in the region of opening 2 (Fig. 1). To prevent any ingress of water in the regions below the side elements 5 and 6, the locking flap 7 is provided

with cylindrically shaped side elements 24 and 25 in those regions. Vertical grooves 26 and 27, respectively, are provided behind elements 24 and 25, viewing towards the outside. By means of these grooves, any water entering via the cylindrical side elements 24 and 25 is discharged downwards. Such water is also discharged by small channels 28 provided in the side elements. As may be seen from Fig. 3, the side elements, in particular the side element 6, shown in Fig. 3 on the right, are substantially cylindrically shaped, thus forming a narrow gap with the cylindrically shaped element 25 and 24, respectively, of the locking flap 7.

With regard to Fig. 3, it has already been mentioned that the built-in position is shown on the right. In that position, the locking means 1 is perpendicularly arranged with respect to its contour 29 and may be tilted from there by up to 25° in a functional range F. This second position is shown on the left in Fig. 3. In the illustrated example, the slope of the outer surface 21 of the lower recessed wall panel 4 relative to the horizontal 30 is such that any fluid, such as rain water, is still reliably discharged.

This lower built-in position of Fig. 3 illustrates a further essential advantage of the locking means according to the invention. If, for example, wind drifts water from right to left, that position would be the most critical. As the lower edge 23 of the locking flap 7 rests against the outer surface 21 of the lower recessed wall panel 4 (not shown in the drawing), the lower region is reliably sealed. In addition, in particular step 17 prevents any wind-driven water from entering the upper region of gap 18. It is shown quite clearly that when the locking flap 7 is pivoted in the direction of arrow 10, the gap 18 between the inner face 19 of the upper front wall panel 3 and the locking flap 7 increases. As a result, any ice formed in gap 18 is broken up and jammed objects are automatically released.

A self-locking latch and actuator means 31 for pivoting a component to one of two positions is described below with reference to Figs. 4 to 8. The component to be pivoted as shown in the figures is the locking flap 7 of the locking means 1 designed according to the invention, which is shown in greater detail in Figs. 1 to 3.

The actuator used to pivot component 7 is a reversible geared electromotor 32. A drive arm 34 is arranged on the driven shaft 33 of the motor 32. A pin 35 is fixed to the end of drive arm 34. When arm 34 is actuated, this pin 35 moves along an arc 36. Pin 35 is guided in a slot 37 provided in an actuating lever 38. Actuating lever 38 is pivotable about an axis 9, one side of which is engaged by the actuator through pin 35 arranged in slot 37 and on the other side of which the pivotable component 7 is arranged. The guide slot 37 is divided into two parts 39 and 40. The first part 39 is designed such that its centerline lies substantially on the arc 36 described by pin 35. The advantage of this is that in the starting phase of the motor 32, the latter has to accelerate itself and its components only to leave the position shown in Fig. 4 and to move the pin 35 to the beginning of the second part 40 of the guide slot 37. Thus, the motor performs no displacement work on the actuating lever 38 in the region of the first part 39 of the guide slot 37.

The second part 40 of the guide slot 37 is arranged relative to the first part 39 at such an angle and designed in such a manner that the pin 35 applies a displacement force to the sides 41 and 42 of the second part 40 of the guide slot 37 in a direction which is substantially perpendicular to the pivotal radius 43. The pivotal radius 43 represents the connecting line extending through the pivotal axis 9 of the actuating arm 38 and substantially through the center of the pivotable component 7 fixed thereto. The angle between the first part 39 and the second part 40 of the guide slot 37 is chosen such that when the actuating arm 38 is pivoted about its axis 9, the direction of force action is retained, i.e., it is substantially perpendicular to the pivotal radius 43. This direction is retained until the respective displacement end position has been reached. At the driving end of the actuating lever 38 a component 44 is arranged which actuates a sensor 45 or 46 in the respective end positions. The position of the actuating lever 38 and the pin 35 in the guide slot 37, Fig. 4, is the latched position. In this position, the opening between the wall panels 3 and 4 is closed by the locking flap 7. If, for example, a force is applied to the locking flap 7 in a direction from the lower wall panel 4 to the upper wall panel 3, the force action of the actuating lever 38 on pin 35 and its arm 34 is such that the actuating lever 38 is prevented from moving.

Fig. 5 shows the same arrangement as Fig. 4, with the actuator pin 35 assuming another position on the arc 36 as a result of the pivotal motion of the drive arm 34 of motor 32. This other position is shown at the very point where parts 39 and 40 of the guide slot 37 coincide. Pin 35 rests against side 41 of the guide slot 37. As shown in Fig. 5, the locking flap 7 of the locking means 1 is not yet removed from the lower recessed wall panel 4. This means, that the opening, although still being closed, is unlatched at this stage. As the drive arm 34 with its pin 35 is moved further along the arc 36 in the direction of arrow 47, the actuating arm 38 is pivoted.

Fig. 6 shows the same arrangement as Figs. 4 and 5, but with the movable components assuming another position. Compared with Figs. 4 and 5 and the sequence shown therein from the latched to the

unlatched position, Fig. 6 depicts pin 35 halfway along the second part 40 of the guide slot 37. For this purpose, pin 35, by being actuated by motor 32 and pivoting the drive arm 34 in the direction of arrow 47, slides along the arc 36 on side 41 of the second part 40 of guide slot 37. In response to this, actuating lever 38 with its part 44, actuating the sensors, assumes a position roughly halfway between the two sensors 45 and 46. Subsequently, the locking flap 7 of the locking means 1 is removed from the lower wall panel 4, releasing half of the opening provided therein.

The arrangement of Figs. 4, 5 and 6 is again shown in Fig. 7, but in an end position opposite to that of Fig. 4. Compared with Fig. 6, motor 32 has moved pin 35 with its drive arm 34 further along arc 36 in the direction of arrow 47. As a result, pin 35 in the second part of the guide slot 37 is moved to the end of that part, with the drive arm 34 coming to rest against a stop 52. This stop 52 may be made of a flexible material, so that the end position is reached smoothly. The end position is detected by part 44 of the actuating lever 38 and the associated sensor 46. In that position, actuating lever 38, by being pivoted about axis 9, moves the locking flap 7 of the locking means 1 to a position where it is at maximum distance from the recessed wall panel 4. As a result, the opening is formed between the inner face 22 of the lower portion of the locking flap 7 and the lower edge 20 of the upper front wall panel 3 on the one hand and the top edge 49 of the lower recessed wall panel 4 on the other. The inner face 48 of the lower wall panel 4 is inclined, and locking flap 7 is provided with a face 50 on its inside. These two faces 48 and 50 form kind of a chute through which items to be released, such as bank notes or statements of account, are reliably diverted to the outside.

The operating direction from the latched and/or closed position to the unlatched and fully opened position has been described above in the order of Figs. 4 to 7 and with reference to the respective movement of the drive arm 34 in the direction of arrow 47. During that phase, pin 35, by force transfer, acts on side 41 of part 40 of the guide slot 37. When the motor 32 is started, this sequence may be reversed, so that pin 35 from the position shown in Fig. 7 acts on side 42 of part 40 of the guide slot 37, pivoting the actuating lever 38 in a direction causing the locking flap to be moved downwards in a closing direction about pivotal axis 9. This movement continues until pin 35 has been restored to the position shown in Fig. 5, in which the opening is already closed but not yet latched. By pivoting pin 35 from the position of Fig. 5 to the position of Fig. 4, the locking means is latched.

To ensure that the end positions are reliably reached, the electromotor 32 is controlled such that the current in the end positions is switched off only after a certain increase in current has been detected. This is the case whenever pin 35 encounters a greater resistance at the end of part 39 or 40 of the guide slot 37. To support this, it may be expedient for drive arm 34 to come to rest against flexible stops such as those designated as 52 in Fig. 7. Sensors 45 and 46 which are used to detect the respective end position may be, for example, photosensors.

The arrangement shown in Figs. 4 to 7 is inclined relative to the horizontal. This inclination substantially corresponds to an ergonometrically satisfactory built-in position of about 30 to 35° to the horizontal. As a result, any items fed through the opening to the outside or placed therein for removal can be be readily removed.

Fig. 8 is a schematic rear top view of the arrangement shown in Figs. 4 to 7. A carrier arm 53 is fixed to side element 5 which, as shown in particular in Fig. 1, links the upper front wall panel 3 with the lower recessed wall panel 4. Motor 32, moving the drive arm 34 with pin 35 by its driven shaft 33, is fixed to carrier arm 53. Pin 35 is guided in guide slot 37 (not shown in Fig. 8). In response to the movement of pin 35 in the guide slot of the actuating lever 38, the latter along with the attached locking flap is pivoted about axis 9. In addition to other components, not shown, sensor 45 is fixed to carrier arm 53. Component 44, arranged on the actuating lever 38, actuates sensor 45 in the respective end position. Carrier arm 53 is also provided with a stop 52 against which drive arm 34 rests in the opened end position.

By the locking means 1 designed according to the invention water is reliably repelled in the different built-in positions so that the formation of ice is either substantially avoided or any ice forming despite of these precautions does not interfer with the operation of the locking means. This applies also to items that become jammed as a result of vandalism. The subject-matter of the invention operates such that any jammed items are released as the width of the opening increases and that generally they do not prevent the locking means from being opened. Needless to say, the power of the motor used for this purpose and the force at which an item is introduced into the flap are significant. The self-locking latch and actuator means according to the invention has a simple design and may be used to particular advantage for the locking means according to the invention.

Claims

1. Locking means for an opening in the wall of a self-service device, in particular for the dispense or deposit gate of an automatic teller machine, characterized in that

a) the opening (2) is limited by an upper front wall panel (3) and a lower recessed wall panel (4) as well as two side elements (5, 6) connecting said panels, the lower recessed wall panel (4) being recessed farthest adjacent to the upper wall panel (3),

b) a locking flap (7) is provided which, when opening (2) is closed, is positioned partly behind the upper front wall panel (3) and in front of the lower recessed wall panel (4),

c) the locking flap (7) is pivotably supported on an axis (9) parallel to opening (2),

d) the locking flap (7) to be opened is pivoted or twisted upwards (10),

e) the outside of the locking flap (7) in the region of the upper (14) and the lower edges (15) is substantially cylindrically shaped, and

f) the locking flap (7) between the cylindrically shaped regions (14, 15) is provided with a substantially planar recess or indentation (16) such that when the locking flap (7) is twisted open, the gap (18) between said flap (7) and the inner face (19) of the upper front wall panel (3) increases as the twisting of said flap continues.

2. Locking means according to claim 1, characterized in that the substantially planar recess or indentation (16) recedes in step form (17) from the upper cylindrical region (14) towards the inside of the opening (2).

3. Locking means according to claim 1 or 2, characterized in that the inner face (19) of the upper front wall panel (3) is inclined towards the top and the inside to match the pivotal range of the locking flap (7).

4. Locking means according to any one of the preceding claims, characterized in that the lower edge (20) of the top front wall panel (3) is extended downwards, projecting in nose form the upper portion of the transition between the cylindrical region (14) and the substantially planar recess or indentation (16), in particular step (17).

5. Locking means according to any one of the preceding claims, characterized in that the shape of the inner face (22) of the lower portion of the locking flap (7) is adapted to the outer face (21) of the lower recessed wall panel (4), so that reliable sealing is ensured in the closed state by the inner lower edge (23) of the flap (7) resting against face (21).

6. Locking means according to any one of the preceding claims, characterized in that

a) in the region of the connecting side elements (5, 6), the locking flap (7) has cylindrical side elements (24, 25), whose shape is adapted to that of the side elements (5, 6) with minimum gap width;

b) behind the cylindrical side element (24 and 25, respectively), the sealing flap (7) is provided with a vertical groove (26 and 27, respectively), and

c) each side element (5, 6) is provided with a small channel (28) sloping in a downward direction relative to the opening (2) and the outer face (21) of the lower recessed wall panel (4).

7. Locking means according to any one of the preceding claims, characterized in that the functional built-in position, relative to the outer contour (29) of the locking means (1), is in a range (F) from the vertical to an angle of about 25° between the contour (29) and the horizontal (30), with the outer face (21) of the recessed wall panel (4) still being sloped to discharge, for example, water.

8. Self-locking latch and actuator means (31) for pivoting a component (7) to either of two positions, with at least one position being latched, comprising a geared reversible electromotor (32) with a drive arm (34), in particular for actuating a locking means (1) according to any one or combination of claims 1 to 7, characterized in that

a) the drive arm (34) is guided by a pin (35) in a guide slot (37) of an actuating lever (38),

b) the actuating lever (38) is pivotable about an axis (9), one side of which is engaged by actuator means (32, 34, 45) and on the other side of which the pivotable component (7) is positioned,

c) a first part (39) of said guide slot (37) is designed such that its centerline lies substantially on the arc (36) described by pin (35), so that in this region the motor (32) performs no displacement work on the actuating lever (38),

d) a second part (40) of the guide slot (37) is positioned at such an angle to said first part (39) and is designed such that the pin (35) exerts a displacement force on sides (41, 42) of the second part (40) in a direction which is substantially perpendicular to the line of the pivotal radius (43), said radius (43) being formed by the connecting line extending through the pivotal axis (9) of the actuating arm (38) and substantially through the center of the pivotable component (7) fixed thereto, and

e) the angle between the first (39) and the second part (40) of the guide slot (37) is selected such that when actuating arm (38) is pivoted in the

said substantially perpendicular direction, the direction of force action is retained until the respective displacement end position has been reached.

9. Latch and actuator means according to claim 8,
characterized in that the actuating lever (38) is slightly S-shaped.

10. Latch and actuator means according to claim 8 or 9,
characterized in that sensors (45, 46) are provided for detecting the end positions of the actuating lever.

11. Latch and actuator means according to any one of the claims 8 to 10,
characterized in that the drive current of the motor (32) in the two end positions is switched off only after a certain increase in current has been detected, thus ensuring that reliable end positions are obtained.

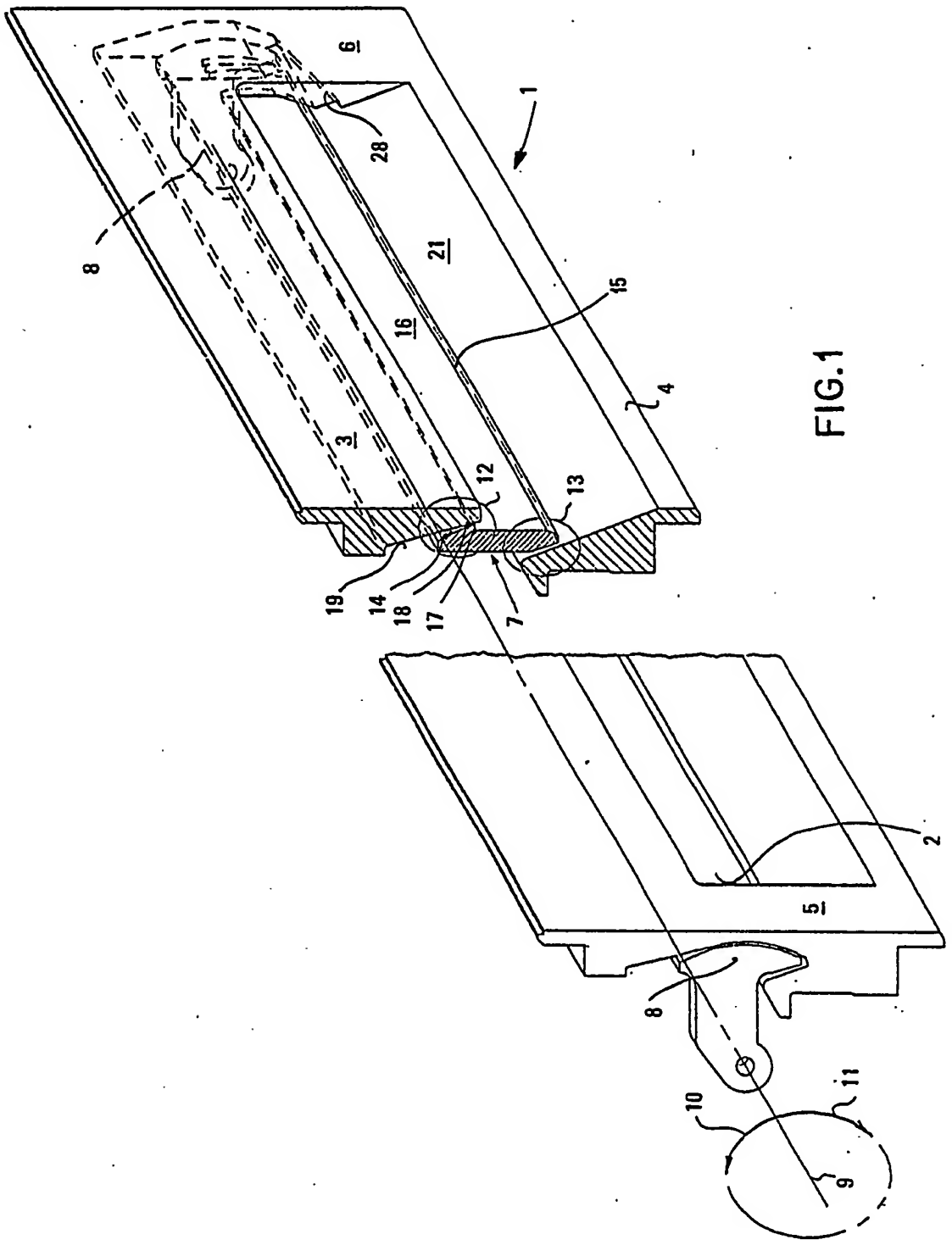


FIG.1

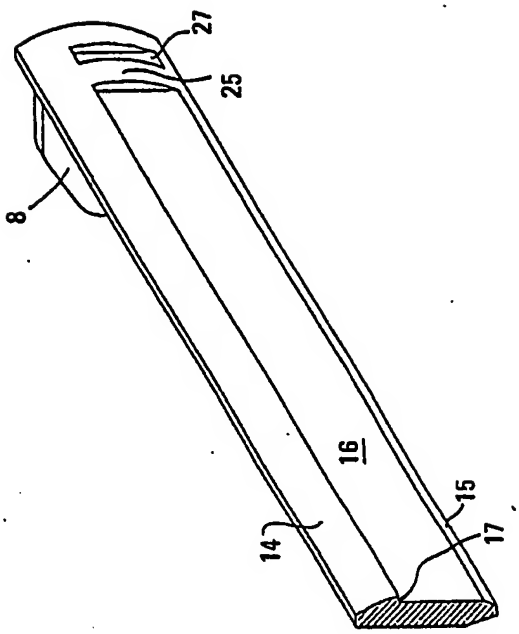
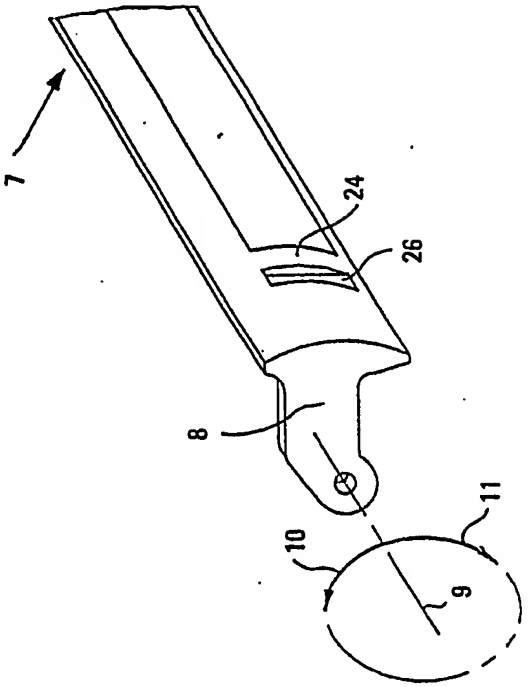


FIG. 2



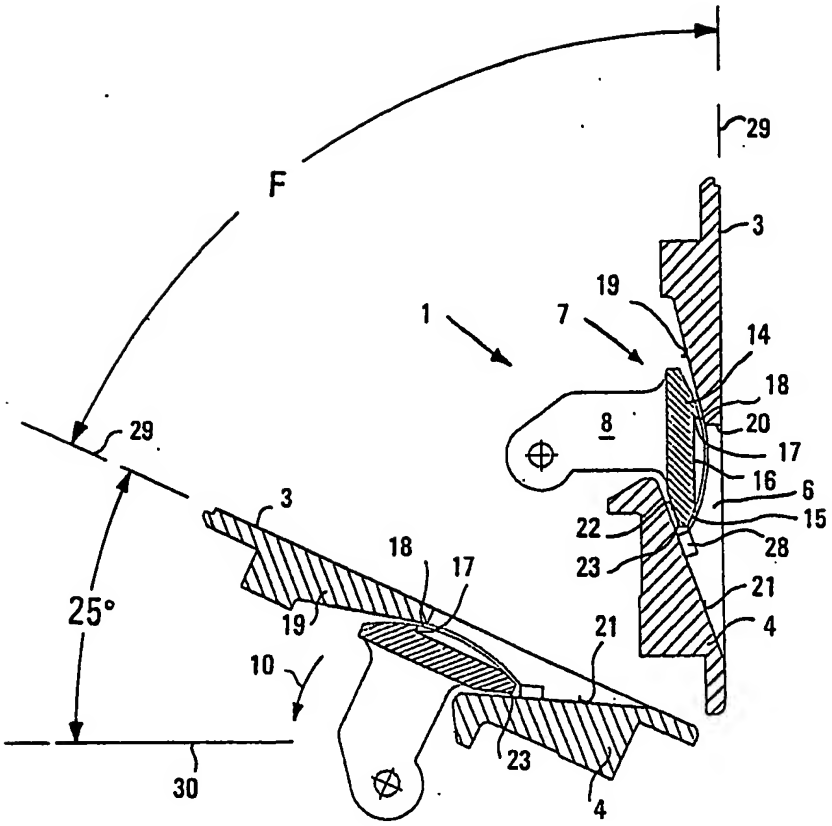

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FIG. 3

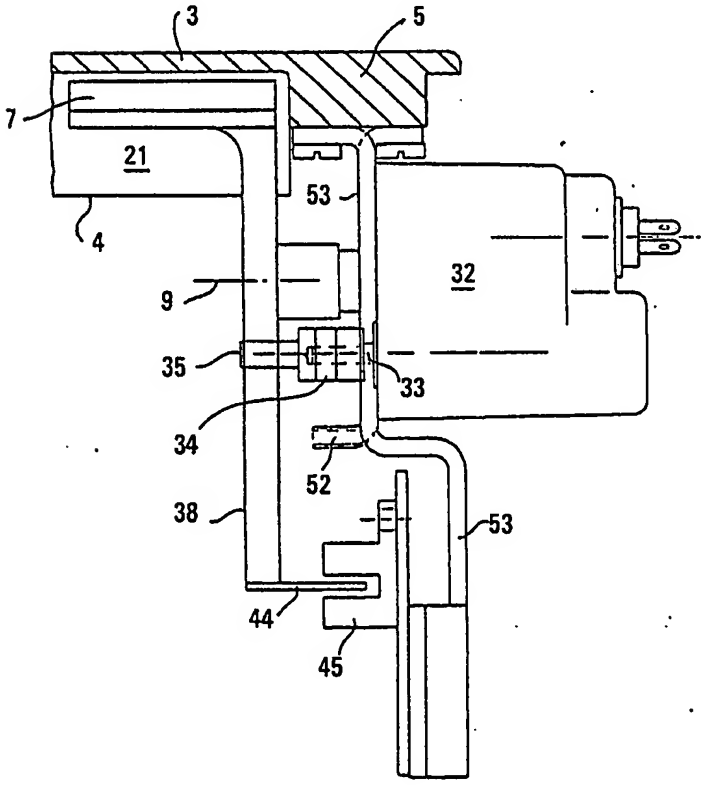
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FIG. 8

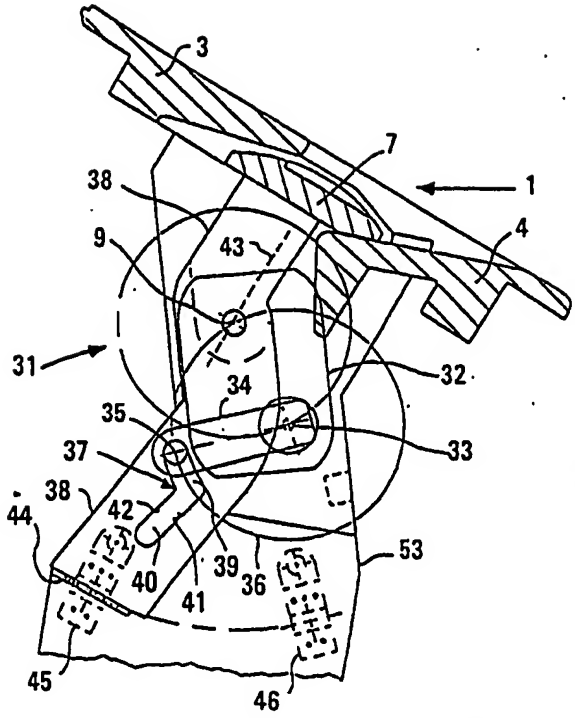

FIG. 4

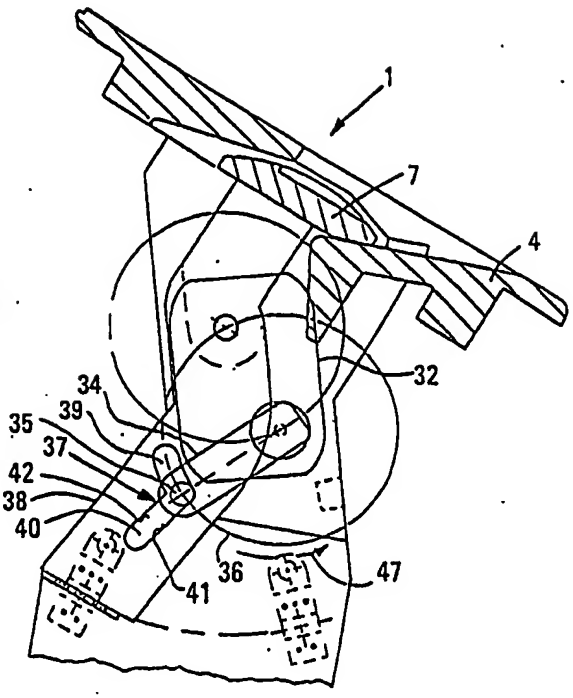

FIG. 5

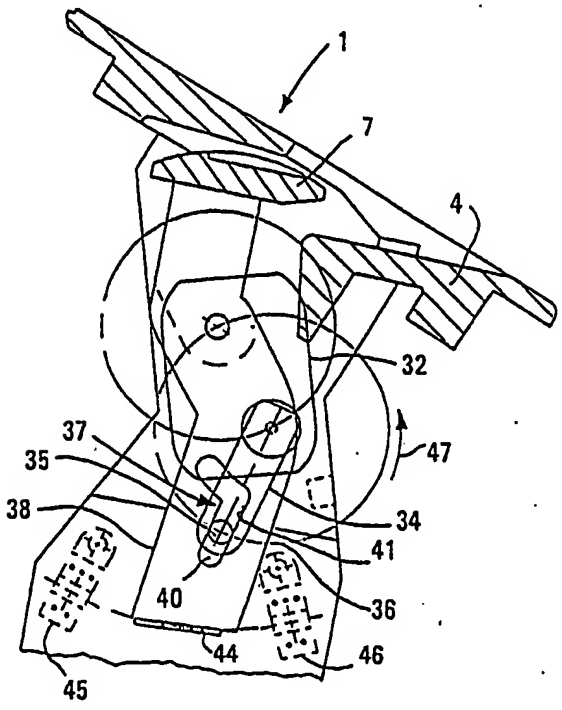

FIG. 6

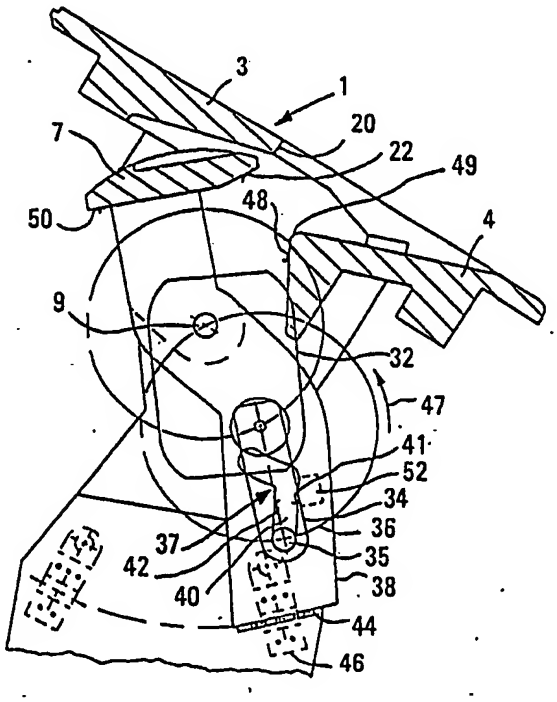

FIG. 7

European Patent Office

EUROPEAN SEARCH REPORT

Application number

DOCUMENTS CONSIDERED TO BE RELEVANT

EP 88111429.2

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	US - A - 4 251 009 (MC LAUGHLIN et al.) * Totality * --	1,8,10	G 07 F 7/00 G 07 D 1/00 B 65 D 91/00 A 47 G 29/126 E 05 G 7/00
A	DE - A - 2 059 802 (SÜD-BÖHL, DANIEL GARTHE) * Totality * --	1,4,5,6	
A	GB - A - 2 103 479 (KENNETH) * Totality * --	1,3,5,6	
A	US - A - 1 305 732 (MASON) * Totality * --	3,4	
A	DE - A1 - 2 528 537 (NCR CORP.) * Totality * --	1	
A	EP - A1 - 0 034 502 (DE LA RUE SYSTEMS LIMITED) * Totality * --	1	
A	EP - A1 - 0 089 785 (DE LA RUE SYSTEMS LIMITED) * Totality * --	1	
A	DE - A1 - 2 619 125 (MARTENS BRANDKASTEN B.V.) * Totality * ----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)
A 47 G 29/00
B 65 D 91/00
E 05 G 1/00
E 05 G 7/00
E 06 B 3/00
E 06 B 9/00
G 07 D 1/00
G 07 D 9/00
G 07 F 5/00
G 07 F 7/00
G 07 F 9/00
G 07 F 11/00

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	11-01-1989	BEHMER

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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